

Fertilizer & Pesticide

Point and Nonpoint Source Contamination

Identifying Sources of Water Pollution

Most cases of ground and surface water impairment in Montana are a direct result of human activity. These activities are often associated with agriculture, construction, forestry, mining and population centers. In some cases natural sources, such as salt or minerals, can degrade water. In any case, ground and surface water contamination can and has had serious economic and health consequences.

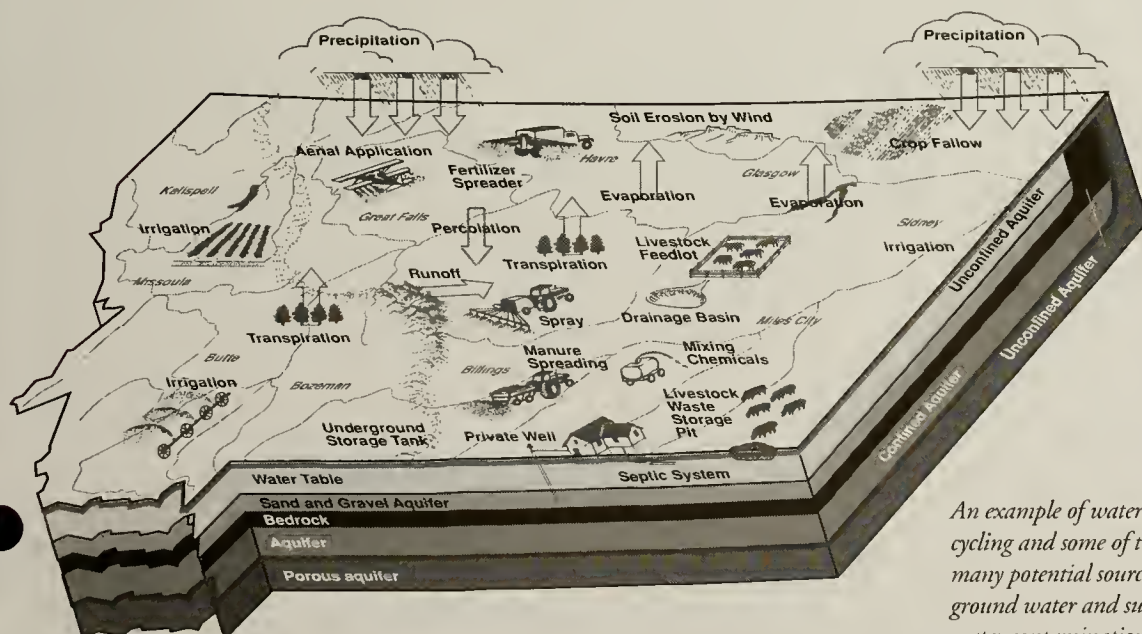
Some land areas and activities have a higher potential for contaminating surface waters. All agricultural cropland has the potential for contributing nutrients to surface waters; however, some sites are more likely to develop problems than others. For example, surface water that is near barnyards is highly susceptible to nutrient loading from barnyard runoff. Urban areas also can contribute significant amounts of nutrients to surface water. Sewage and other effluent deposited into a water body without adequate treatment can have a tremendous impact on water quality.

Point Source Contamination

Degradation of surface water can usually be detected more easily than ground water contamination. Likewise, *point source contamination* — where the source or point of contamination is readily identifiable — is easier to detect than pollution sources that are not concentrated in one area. Often, point source contaminants are from one or a few sources — such as a chemical spill or sewage discharge pipe — and usually involve large quantities. Often, these sources cause dramatic and immediate changes in the water body. However, because point source contaminants are relatively easy to detect, they are also easier to monitor than non-point source contaminants.

Examples of point source contamination include:

- chemical spills
- spills occurring during mixing and loading
- back-siphoning when filling spray tanks
- spills occurring as a result of transportation accidents



An example of water cycling and some of the many potential sources of ground water and surface water contamination from agricultural practices.

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Best Management Practices

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- leaking underground petroleum tanks
- septic tank spills or leaks
- leaks or spills of animal wastes in sludge/sump pond
- improper disposal and storage of solid and hazardous wastes
- improper applications and disposal of chemicals or wastes

Nonpoint Source Contamination

Ground and surface water contamination resulting from human activities in which the pollutants cannot be readily identified is termed *nonpoint source contamination*. Nonpoint source contamination does not result from a discharge at a specific, single location (such as from a pipe). Instead, this type of impairment is associated with agricultural, logging and construction or urban runoff, and occurs when small quantities of dispersed sources accumulate and degrade water resources. The result is that the water's chemical, physical, biological and radiological integrity is altered.

Effects of nonpoint contamination are usually subtle and gradual, making identification of the polluting sources or practices difficult to identify. Impairment from nonpoint sources occurs when the rate at which pollutant materials entering water bodies or ground water exceeds natural levels. Monitoring of nonpoint contamination is often difficult as well.

Runoff and soil erosion from agricultural lands are causes of nonpoint source contamination. Consequences of cropland erosion include removal of fertile topsoil, accelerated eutrophication (reduced oxygen leading to algal bloom and other undesirable plant growth in surface waters) and sedimentation of

surface water, destruction of fish and wildlife habitat, and decreased recreational and aesthetic value of surface water.

Other examples of nonpoint source contamination include:

- wind, soil and water erosion
- saline seeps
- surface runoff
- atmospheric deposition
- normal agricultural chemical and fertilizer use
- sediment eroding from a field
- nutrients and pesticides leached into the ground water through irrigation or precipitation
- land disposal of organic materials (manure, sewage sludge)
- cropping systems

There are measures people can take to reduce the likelihood of water contamination. These measures, referred to as Best Management Practices (BMPs), should be selected based on site conditions and economics. They also need to be integrated with crop, pest and soil management. Often more than one BMP is needed to limit water impairment. To determine what BMPs are appropriate in your situation, see Fact Sheets in this series called *Nutrient and Pesticide Best Management Practices*.

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